

### **Remarks**

Claims 25, 28-38, 40-48 and 74-86 are pending with this Application. Claims 1-24, 26-27, 39 and 49-73 were previously canceled without prejudice.

New Claims 77-86 have been introduced with this paper. Claim 77 includes COD content as measured from cellulose fibers alone. The new claims find support in the originally filed claims and throughout the originally filed specification, including paragraphs [0022], [0032], [0034] to [0038], [0039], [0049], and [0053]. No new matter has been introduced with the new claims. Applicants respectfully request entry of the new claims.

Claims 25, 33, 38, 74 and 76 have been amended. Said amendments are directed to matters of form, may include one or more features disclosed in the subject application and/or make the claims more clear. Support for the amendments may be found in the originally filed claims and throughout the originally filed specification, including paragraphs [0022], [0029], [0032], [0034], [0039], [0049], and [0050]. No new matter has been introduced with the amended claims. Applicants respectfully request entry of the amended claims.

In the Office Action, the following were included in the detailed action:

- Paragraph [0021] of the specification was noted to have missing application numbers;
- Claims 74-75 were rejected under 35 U.S.C 112, second paragraph, as being indefinite; and
- Claims 25, 28-38, 40-46 were rejected under 35 U.S.C 102(b) as anticipated by or, in the alternative, under 35 U.S.C 103(a) as obvious over JP 11-10631 (hereinafter, "Yamada").

With this paper, Applicants address the specification and the rejection under 35 U.S.C 112, second paragraph, as further described on the next page. Applicants respectfully traverse the rejections under 35 U.S.C 102(b) or 35 U.S.C 103(a) as described further.

## **Specification**

Applicants thank the Examiner for comments regarding paragraph [0021] and have amended paragraph [0021] providing updated issued patent information. No new matter has been introduced with said amendments.

### **35 U.S.C 112, second paragraph**

Claims 74-75 were rejected under 35 U.S.C 112, second paragraph. Applicants thank the Examiner for the comments. Applicants have amended Claim 74 to include one or more features disclosed in the subject application and/or make the claims more clear. The amended claim is believed to overcome the rejection and particularly points out and distinctly claims the subject matter that Applicants regard as the invention.

### **35 U.S.C 102(b) or, in the alternative, 35 U.S.C 103(a)**

Claims 25, 28-38, 40-46 were rejected under 35 U.S.C 102(b) as anticipated by or, in the alternative, under 35 U.S.C 103(a) as obvious over Yamada. Applicants respectfully disagree with the rejections for reasons set forth with this paper (as well as presented in previous submissions).

Applicants address below various positions raised in the Office Action as well as the lack of anticipation and lack of obviousness over Yamada.

- A. Position that the claims are anticipated by or are obvious over Yamada. (see pgs. 3 and 4 of the Office Action)

Applicants respectfully disagree with this position. In addition to previous remarks made in earlier submissions by Applicants, Applicants refer the Examiner to Yamada's own teachings regarding COD in the process water, which show that Yamada does not teach or suggest cellulose fibers having a COD content less than 4.5 kg/ton.

Applicants first point out that their filed specification teaches, "the average COD in the process water is about 50 mg/L (ppm) when low COD fibers [fibers treated as claimed] are used"

(para. [0052]). Thus, the process water will be 50 mg/L when cellulose fibers are treated as disclosed by Applicants and as claimed. Yamada, on the other hand, expressly discloses and shows that normally, its average COD level in the process water is 250 ppm (para. [0003] and [0014]; FIG. 1). Yamada also teaches and shows that COD in its process water is *never* 50 mg/ml because it is *always* greater than 100 ppm (see Yamada, para. [0014] and FIG. 1). In fact, Yamada is only able to reduce COD in the process water from 250 ppm to greater than 100 ppm (and *never* below 100 ppm) when Yamada follows a procedure disclosed in para. [0007] *and* combines this with a procedure disclosed in para. [0013]. It is first noted that para. [0007] is what the Examiner relies on to reach a conclusion that the Yamada reference discloses “the claimed COD level of the cellulose fibers.” It is further noted that para. [0013] is a dilution factor that Yamada must use in order to keep its COD in the process water at a level below 250 ppm. Indeed, it is also pointed out that the 100 ppm COD and 250 ppm COD of process water as disclosed with Yamada are *both significantly* greater than the amount of 50 mg/L (ppm) that Applicants teach in their specification. Yamada never shows a COD in the process water of less than 100 ppm. Furthermore, Applicants specification show that COD in its process water never rises to 100 mg/L when cellulose fibers are treated as disclosed (and as claimed). With Applicants specification, a COD in the process water *only* increases (is greater than 50 mg/mL) when non-treated fibers are used. In fact, Applicants specification shows that COD in the process water will only be at an amount of about 115 mg/L *after*: (a) regular (non-treated) fibers are used to replace the treated cellulose fibers (treated as claimed); and (b) after weeks of using the replaced (non-treated fibers)— according to FIG. 3 in Applicants’ specification, it takes four weeks for COD in the process water to rise from 50 mg/L to 115 mg/L. It is, thus, reiterated that the process water of Yamada, as shown in FIG. 1, is never below 100 ppm. Furthermore, the process water of Yamada, as shown in FIG. 1, *immediately* increased to a level greater than 100 ppm in less than one day. Thus, the inability of Yamada to ever disclose a COD in the process water of 50 mg/L shows that Yamada does not disclose the claimed COD level in its fiber. This means that the pulp of Yamada has a COD content that is not less than 4.5 kg/ton, as provided in Applicants’ claims. As such, Yamada neither anticipates nor renders obvious Applicants’ claims.

In making an obviousness determination, the patent rules state that the Examiner is to consider the number of variables that must be selected or modified, and the nature and significance of the differences between the prior art and the claimed invention. The many variables and differences that separate Yamada from the claimed invention have been discussed in previous submissions. These are further remarked on below and in the following pages. For the reasons provided, there is insufficient support for an anticipation or an obviousness determination.

B. Position that claims do “not structurally differentiate the material in the product by process claims 25, 28-38, 40-48 over the cited prior arts” (see pgs. 4 and 5 of the Office Action)

Applicants respectfully disagree with this position. Applicants remind the Examiner that there is no evidence in Yamada itself that the pulp it describes is, in fact, cellulose fibers. Applicants further point out that the application as-filed *does* teach that its material in the product by process claims are structurally distinct, with distinct differences, including unexpected results, recited throughout the specification for products prepared using cellulose fibers treated as described. For example, the subject Application teaches:

1. Cellulose fibers treated as disclosed “improve the mechanical and physical properties of the final building product” (see para. [0041]) Mechanical properties were significantly improved with Applicants described cellulose treatment, as shown in TABLE 2. Improvements include modulus of rupture (MOR), modulus of elasticity, ultimate strain and toughness as compared with an equivalent formulation in which fibers were not treated as disclosed in the subject application.
2. When treating cellulose fibers as disclosed, the fiber itself is not compromised as shown in TABLE 2. While fiber strength may improve with treatment, mean cellulose fiber length is not found to be affected with treatment.
3. When treating cellulose fibers as disclosed, a smaller amount of cellulose fiber will be necessary when making a cement composite material (see para. [0045]).

4. When treating cellulose fibers as disclosed, COD in the process water is 50 mg/L (see para. [0052] and FIG. 3).

Yamada shows no structural differences, such as those listed above.

Assuming that Yamada does disclose cellulose fibers (there is no evidence in Yamada itself that its pulp is, in fact, cellulose fibers), Applicants respectfully remind the Examiner that the structure implied by the process steps need to be considered when assessing patentability of a product by process claim. [MPEP 2113] This is said to be important when the product may be defined by the process steps by which the product is made or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product (referencing *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979)). The Examiner has not shown by factual evidence that the claimed product is the same as or even similar to that disclosed by Yamada. Moreover, Yamada does not teach or suggest that it imparts the distinctive structural characteristics to its final product as provided with the subject application. Yamada does not teach or suggest that with addition of its pulp, there is any significant improvement in any mechanical properties of its plate. [Yamada only shows in FIG. 4 that bending strength (MOR) of the plate is reduced when the mixing water—which is white water:normal water in a ratio of 4:1 used to make its plate—has an increased COD content. As discussed above, the COD in the mixing water of FIG. 4 is never less than 100 ppm. Showing a reduction in MOR *because of* an increase in mixing water COD greater than 100 is not the same as showing an improvement in MOR when mixing water COD is reduced to less than 50. This is because Yamada is never able to reach a level less than 100.] Yamada also does not teach that with addition of its pulp, less pulp is used than would normally be included. Yamada does not disclose that average COD in the process water is ever close to 50 mg/L.

The Yamada reference cannot be said nor has it been shown to impart the distinctive structural characteristics to its final product that are imparted to the product defined by the process steps as claimed. There are no facts to support such a conclusion. In addition there has been no articulation as to what teachings or suggestions in the prior art would have motivated one of ordinary skill in the art to re-arrange itself in order to arrive at the claimed species or why,

as is required for a showing of obviousness. Together, the evidence shows that the claimed invention is patentable over Yamada.

- C. Position that “The washing at the elevated temperature does not structurally differentiate the material in the product by process claims 25, 28-38, 40-48 over the cited prior art.” (see pg. 4 of Office Action)

Applicants respectfully disagree with this position. Applicants refer to discussions raised in sections A and B and also wish to direct the Examiner to the original specification, in which Applicants have taught that treating the fibers as disclosed (and as claimed)--which includes a washing process at an elevated temperature between about 65 degrees Centigrade to about 120 degrees Centigrade (see, e.g., para. [0024] of original specification)--does provide (unexpectedly) structural differentiation in the product by process claim by actually improving the mechanical properties of a formed product. In addition, Applicants specification teaches that COD in the process water is significantly reduced. Moreover, Applicants specification teaches that when cellulose fibers are treated as disclosed (and as claimed), less fibers will be required in the formulation and in the product. Considering the number of variables which must be selected or modified, and the nature and significance of the differences between Yamada and the claimed invention, Applicants have shown that Yamada does not anticipate the claims and does not render the claims obvious.

- D. Position that “the source of COD in the Yamada pulp cement mixture is the cellulose fibers.” (see pgs. 4, 5 and 6 of Office Action)

Applicants respectfully disagree with this position. In addition, the Examiner has not provided any clear evidence of this. It is noted that the words “cellulose” and “fiber” do not appear anywhere in the Yamada reference. Yamada’s pulp may or may not be wood pulp and the reference does not teach individual fibers or delignified fibers as taught and claimed by the subject application.

Applicants wish to redirect the Examiner to the cumulative evidence including that which is taught in Applicants’ own specification, and as provided earlier as secondary evidence (see

submission of Nov. 30, 2009) and from expert testimony provided by Applicants (see submission of Feb. 24, 2009). Both Applicants specification and the secondary evidence show that Yamada does not teach COD content of cellulose fibers. Moreover, the expert testimony provided by Applicants articulated that a person of skill in the art would not arrive at the same conclusion arrived at by the Examiner. The MPEP states, "Expressions of disbelief by experts constitute strong evidence of nonobviousness." [Referencing: *Environmental Designs, Ltd. v. Union Oil Co. of Cal.*, 713 F.2d 693, 698, 218 USPQ 865, 869 (Fed. Cir. 1983) (citing *United States v. Adams*, 383 U.S. 39, 52, 148 USPQ 479, 483-484 (1966))]

Based on the evidence as a whole, the facts (in relation to the *Graham* factors) do not support a *prima facie* case that the claimed invention would have been obvious to one of ordinary skill in the relevant art at the time the invention was made.

E. Position that "Yamada thus discloses the claimed COD level of the cellulose fibers prior to combining into composite, or in the least, it would have been obvious to one skilled in the art at the time the invention was made that Yamada discloses the claimed COD level in the cellulose fibers..." (see pgs. 4, 5, 6 of Office Action)

Applicants respectfully disagree with this position. Applicants wish to direct the Examiner to expert testimony provided by Applicants in which it was articulated that a person of skill in the art would not have looked to Yamada and concluded that Yamada disclosed the claimed COD level of the cellulose fibers. Because, as the Examiner articulated, Yamada measures COD from a cement-pulp slurry and does not measure COD of cellulose fibers, there is no evidence in Yamada that it is able to disclose a COD level of cellulose fibers nor the claimed COD level. Certainly Applicants' submission of an expert affidavit has provided more than reasonable doubt about Yamada when the testimony affirmed that Yamada is not capable of disclosing that which is claimed. The MPEP states, "Expressions of disbelief by experts constitute strong evidence of nonobviousness." [Referencing: *Environmental Designs, Ltd. v. Union Oil Co. of Cal.*, 713 F.2d 693, 698, 218 USPQ 865, 869 (Fed. Cir. 1983) (citing *United States v. Adams*, 383 U.S. 39, 52, 148 USPQ 479, 483-484 (1966))]

F. Position that “In the event any differences can be shown for the product of the product-by-process claims 25, 28-38, 40-48, as opposed to the product taught by the reference Yamada, such differences would have been obvious to one of ordinary skill in the art as a routine modification of the product in the absence of a showing of unexpected results.”

Applicants respectfully disagree with this position. Applicants wish again to direct the Examiner to the original specification, in which unexpected results were shown in the form of improved mechanical properties of the product (not shown by Yamada), significantly reduced COD in the process water (not obtainable by Yamada), as well as less fibers in the product (not shown by Yamada). Thus, differences can be shown for the product as claimed in view of unexpected results. As such, Yamada does not anticipate the claims and does not make the claims obvious.

Applicants respectfully submit that at least for the reasons provided above, the claimed invention is not anticipated by and is not obvious over Yamada.

G. Further facts

Further facts gleaned from the Yamada reference itself show that the claimed invention is patentably distinct from Yamada’s plate (and formulation used to make the plate). These facts include the following:

1. Yamada does not teach or suggest delignified and individualized cellulose fibers as claimed in independent Claims 25, 33, 76, 77 and 82. Neither the word “cellulose” nor the word “fiber” appear anywhere in the Yamada reference. Neither does Yamada express, teach or suggest the words “delignified” or “individualized.”
2. Yamada does not express, teach or suggest measuring COD content of cellulose fibers or cellulose fibers alone as claimed in independent Claims 25, 77 and 82. Yamada measures a COD level from a cement-pulp slurry mixed for 5 minutes. In Yamada, the pulp is not said to be delignified or individualized. In Yamada, the pulp is not stated to be cellulose fibers. Furthermore, there is no evidence in



Yamada that it measures the entire COD content of its pulp or that the COD it measures is only from cellulose fibers.

3. Yamada does not express, teach or suggest that its pulp is treated as claimed or that any cellulose fibers are pretreated as claimed prior to incorporation into the building material or formulation, as claimed in independent Claims 25, 33, 74, 76, 77, and 82. Yamada teaches nothing about its pulp except that it normally exhibits a white water COD of 250 ppm (which is far higher than disclosed by Applicants' specification, either with treated or non-treated cellulose fibers).
4. Yamada does not express, teach or suggest a formulation or product as claimed, which includes at least a binder, and an aggregate and one or more density modifiers and one or more additives and delignified and individualized cellulose fibers, as claimed in independent Claims 33 and 76. Yamada only teaches a plate made of 40 parts by wt. cement, 40 parts by wt. silica, 6 parts by wt. pulp, and 14 parts by wt. inorganic filler. There is no evidence in the reference or one provided by the Examiner that would motivate one to alter Yamada's disclosed formulation or a reason as to why it would alter its formulation for making its product.
5. Yamada does not express, teach or suggest using any of the processes of Hatschek, Mazza pipe, Magnani, injection molding, extrusion, hand lay-up, multi-wire forming, gap blad forming or bel-roll forming to make its composite building material as claimed in independent Claim 74. Yamada teaches only a Fourdrinier method of making its plate (para. [0008], [0010]). The Fourdrinier method is not the same as those disclosed in the claim. There is no evidence in the reference or one provided by the Examiner that would motivate one to alter Yamada's disclosed method or a reason as to why it would alter its method for making its plate.
6. Yamada does not teach or suggest a formulation or product with a cementitious binder up to about 35wt. % and an aggregate up to about 57 wt.% as claimed in Claims 77 and 82. In fact, Yamada expressly teaches 40 wt. % of Portland

cement. There is no evidence in the reference or one provided by the Examiner that would motivate one to alter Yamada's disclosed formulation or a reason as to why it would alter its formulation.

7. Yamada does not teach or suggest including in a cellulose fiber washing process chemicals that react with COD compounds causing the COD compounds to be more soluble and to reduce COD content of the cellulose fibers as claimed in Claim 74. Yamada does not teach anything at all about a washing process for cellulose fibers. There is no evidence in the reference itself nor is there one provided by the Examiner as to why Yamada would add any washing process for cellulose fibers.

#### H. Preponderance of Evidence

According to the MPEP, the ultimate determination of patentability is based on the entire record, by a preponderance of evidence, with due consideration to the persuasiveness of any arguments and any secondary evidence. [referencing: *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992)] It is further stated that the legal standard for "a preponderance of evidence" requires the evidence to be more convincing than the evidence which is offered in opposition to it. Moreover, with regard to rejections under 35 U.S.C. 103, the examiner must provide evidence which as a whole shows that the legal determination sought to be proved (i.e., the reference teachings establish a *prima facie* case of obviousness) is more probable than not. In view of the facts and evidence presented with this paper, the Examiner has not established a *prima facie* case of obviousness nor provided additional or separate evidence that, as a whole, shows that Yamada is more probably obvious than not.

Applicants respectfully reiterate here and, in previous responses, that it has been shown by facts and evidence that Yamada does not teach each and every element as claimed nor does it suggest (in combination with what is known to one of skill) what is claimed. Yamada does not teach or suggest what the COD content of cellulose fibers is because Yamada does not teach or suggest a known, reliable or accurate method for measuring COD content of cellulose fibers. The method of measuring COD in a pulp-cement slurry as taught by Yamada is insufficient to be

capable of teaching or suggesting Applicants claimed invention. In fact, Applicants have provided additional evidence of this by using the description provided by Yamada to show that COD value measured from a pulp-cement slurry is not the same as or similar to a COD value measured when using the method described in the subject application (see submission dated Nov. 30, 2009). Applicants additionally reiterate that there is no clear evidence in Yamada itself that its pulp is, in fact, cellulose fibers. Applicants have also by expert testimony provided evidence that an expert in the relevant field does not believe that Yamada discloses a COD content of cellulose fibers as claimed (see submission dated Feb. 24, 2009). Furthermore, Yamada has shown in its very own teachings that COD in its process water, even when incorporating a method relied on by the Examiner (i.e., para. [0007]), is unable to achieve a value even close to 50 mg/L, which is what Applicants achieves when it uses cellulose fibers as disclosed and claimed, with a COD content less than 4.5 kg/ton.

Together the evidence offered by Applicants in opposition is more convincing that what has been presented in the Office Action, which means that the rejection under 35 USC 103 is highly questionable and not more probable. Accordingly, Applicants also respectfully submit that the preponderance of evidence is more convincing that Yamada does not anticipate and is not obvious over the claims. In addition, it is noted that no statement or reason(s) have been presented as to why the evidence offered by the Applicants was not convincing. The MPEP states, "If, after evaluating the evidence, the examiner is still not convinced that the claimed invention is patentable, the next Office action should include a statement to that effect and identify the reason(s)."

Applicants also remark on a statement made on page 7 of the Office Action that the claims did not include a feature of the COD measurement method. In view of the discussion presented with this paper, Applicants do not believe that the claims require full recitation of a COD measurement method. Applicants have already shown by a preponderance of evidence that Yamada does not anticipate nor is it obvious over the claimed invention.

Applicants note that Claim 25 does include features of the COD measurement method. Applicants have further amended this claim for clarity purposes.

Applicants further state that the claims provided in the Listing of Claims are not disclosed, described, taught or contemplated by the prior art made of record by the Examiner. Applicants respectfully submit that this Application is in condition for allowance and respectfully request that the Examiner allow the claims listed in the Listing of Claims beginning on page 3 of this paper.

### **Conclusion**

In light of the remarks presented with this paper, Applicants Applicants respectfully request the application proceed to allowance.

Fees for an additional independent claim and a petition are included with this paper. This paper also serves as a petition for an extension of time for any needed extension of time, such as that pursuant to 37 C.F.R. § 1.136. Applicants respectfully request that the Commissioner grant such a petition should it be required and authorize the Commissioner to charge the extension fee due and not paid for with such a petition to Deposit Account No. 07-0153 of Gardere Wynne Sewell LLP and reference Attorney Docket No. 129843-1022. Please credit any overpayment to this same Deposit Account.

This is intended to be a complete response to the Office Action dated May 27, 2010. Should the Examiner have questions, comments, or suggestions in furtherance of the prosecution of this Application, please contact Applicants' representative at 214-999-4330. Applicants, through their representative, stand ready to conduct a telephone interview with the Examiner to review this Application if the Examiner believes that such an interview would assist in the advancement of this Application and/or place the application in condition for allowance.

**Please direct all correspondence to the practitioner listed below at Customer No. 60148.**

Respectfully submitted,

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